Journal of Environment and Earth Science
ISSN 2224-3216 (Paper) ISSN 2225-0948 (Online)
Vol.6, No.12, 2016

Earthquake in Nepal and the Destruction of Monuments: A Case Study of Bhaktapur Durbar Square, Nepal

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Abstract:
This manuscript deals with architectural features which focus on construction technology and materials and the destruction of monuments by earthquake and anti-seismic technology. The techniques are concentrated on the historical and architectural value of Nepali architecture. The write-up will focus on the traditional techniques in modern way but using the same technology to save the other monuments from the natural disasters in Nepal. In some cases some monuments are heavily damaged by the structural strength or due to the age of the building. In both cases modern technology and material are used and some structural system has been completely changed but in Nepal, because of architectural value and Newar technology the architects, engineers, municipality and other authority who are directly involved to the restoration work, want to keep the traditional technology for next future generation. The purpose of this study is to introduce the strategies, construction detail and ensure the guard of the prevailing monuments as well.

Key words: Architecture, Earthquake, Technology, Monuments, Disasters, Heritage and so on

1. Introduction:

The uniqueness of the Nepal architecture is the richness of history, which makes Nepal so attractive to the others and UNESCO declared (this place) as a world heritage site. The recent earthquake of Nepal, 2015 Gorkha earthquake damaged lots of historic buildings on very large geographical basis. Some buildings suffered a lot related to the structural strength and some are damaged because of decays rather than earthquake. Some suggested that using new materials can be a better solution to make the structure more durable and some materials are good (Specially) against earthquake. But 55 window palace and krishna temple in Nepal has drawn a significant example. Nepal's background structure is pre-business and uses herbal building materials and domestically advanced technology, all of which stand in stark comparison to the earthquake resistant planning and construction code necessities which are primarily based on business materials like metallic and concrete and the knowledge how, analysis structures that promote them. Those make reconstruction of Nepal heritage buildings with cultural relevance. Significantly challenging and lack of cloth, technological and aesthetic values, its authenticity in addition to integrity, looms huge as an imminent reality. In order to avoid any such crisis on Nepali heritage, reconstruction of background buildings want to be backed in through a priority policy of advertising and use of indigenous building knowledge machine and technology.

2. Critical Literature Review:

2.1. Earthquake in Nepal:

The main source of seismic activity in Nepal is the seduction of the Indian plate under the Tibetan plate or Himalayas. Earthquakes have always been a serious threat for the population of Nepal.

2.2. Geology of Nepal:

About 40 years ago, with the striking of Indian plate and Eurasian plates Himalaya was shaped. It has broadened in 2400 km east- west route. The width is 230-320 km and limited between Indo genetic plain in the south and Tibetan level in the north.

There are five morph geotectonic zones-

- Lesser Himalaya: potential for metallic mineral, industrial mineral, marble, fuel mineral, gemstone
- Higher Himalaya: promising for precious stone, marble and metallic mineral
- Inner Himalaya: prospective for limestone, gypsum, salt, natural gas.

All have their own liner geological structure. The linear geological structure which makes the limited line are Main frontal thrust (MFT), Main boundary thrust (MBT), Main central thrust (MCT) and south Tibetan detachment Fault), System (STDFS).

2.3. History of Nepal Earthquake:

Seismicity is thought to be high in this district taking into account the recurrence and quality of past earthquake. Nepal has encountered countless earthquakes before. The written history demonstrates that seismic tremors in 1255, 1408, 1810 1833, 1934 1980, and 1988 and in 2015 were the real ones in charge of vast number of death toll & property in various part of the nation as appeared in underneath.

Table: Damaged by earliest Earthquake

Year	Date	Magnitude	Earthquake	Death	Injuries	Collapsed	Damage
1993	-	-	Jajarkot	-	-	40% buildings	
1988	21 Aug	6.6	Udayapur	721	6453	22328	49045
1980	04 Aug	6.5	Bajhang	46	236	12817	13298
1934	15 Jan	8.4	Bihar/Nepal	8519	-	80893	12635
1837	17 Jan	-	-	-	-	-	-
1834	Sept- Oct	-	-	-	-	-	-
1833	26 Aug	-	-	-	-	18000 in total	-
1823	-	-	-	-	-	-	-
1810	May	-	-	Moderate	Moderate	Heavy	-
1767	Jun	-	-	-	-	-	-
1681	-	-	-	-	-	-	-
1408	-	-	-	Heavy	Heavy	Heavy	-
1260	-	-	-	-	-	-	-
1255	One third of the total population including King Abhaya Malla killed						

2.4. Study on 2015 Earthquake:

The Gorkha quake 2015 in Nepal and its enormous consequential aftershock of 12 April 2015 (Fig 04) demolished more than 511, 390 structures and partly harmed 286, 767 more. This building debacle executed more than 8, 789 and harmed 22, 309 more. Alongside the colossal human misfortune and enduring, the seismic tremor has likewise realized a heritage crisis harming more than 90% of recorded landmarks with 151 breakdowns, 474 enduring substantial harm and around 500 others enduring minor harm (Fig 05). The majority of the seven landmarks zone of the KVWHS endured comparable harm, with upwards of 38 landmarks falling and 157 intensely harmed, sufficiently potential to obscure the National Social character of Nepal.

2.5. Earthquake and destruction in Bhaktapur:

From the information it is effectively noticeable that the destruction was most finished at Bhaktapur. A proportion that is more noteworthy than one just in Bhaktapur, among the subdivisions of Kathmandu Valley. Most, however not all, of the temples in Bhaktapur were crushed totally of seriously harmed as appeared in beneath. The harm in the Kathmandu Valley connected with a noteworthy seismic tremor in 1833, albeit unquestionably not exactly the sum connected with the 1934 quake was one of the greatest quakes in Bhaktapur.

2.6. Newar and Newary Architectural Development:

Newar were the original inhabitant in Kathmandu valley, but there was no evidence when Newar first arrived in Nepal. They are the oldest living group not only in Nepal but also in whole India, and was living in Nepal for a centuries and developed a rich and interesting culture and architecture. Some Indian scholars believe that they came from the north east of India named Nayera now known as Kerala. Some Hindus think that the Newar majority was Buddhist but most of them converted to Hindu by Hindu rulers. Historian supporting theory argues that Newar language is of Tibeto Burman origin and the language was also influenced by the Sanskrit, and the script is closer to Sanskrit to Tibetans. Newar still calls the city Bhaktapur as a capital of Malla period from 12th to 15th century. King Yaksha Malla fortified his capital city to make it invulnerable. The huge gateway and the dattatreya temple still hold the great achievemment of king of Newar Malla. On that time they developed the temples, houses and urban settlements in Bhaktapur. The outstanding development in temple was Taleju temple with three roofs in 1549 AD.The shrines in Tachapa lTole and and the Durbar in Bhaktapur were built in 14th and 15th century. The king Mhendra Malla wanted to do something outstanding task again and wanted to get permission and had to ask a goddess in Bhaktapur. He went to the Bhatgoan and lived with raja Trailokya Malla and tried to influence him to build a temple and at last he was permitted to build a high temple in Durbar square in the shape of Jantra. He returned to Knatipur and completed the temple in 1549 AD with the help of architects and sannyashi, from that time people were allowed to build the high houses in the city. The growing population and scarcity of inner urban spaces were the result of increasing the height of the building. The strong social hierarchy of Newar society regulates the location of the building according to the cast, additional demand of living space family living and religious ties to the shrines and temples in the same and urban space.

3. Objectives of the Study:

The research deals with to save the monuments from the earthquake destruction. The main research question is the physical and technological aspects of traditional techniques of Nepal architecture (newer technology) and how to save the traditional technology after earthquake.

To answer the question following subject research are formulated.

- The earthquake in Nepal and destruction of monuments
- The traditional technical detail of newer structure
- The building material and how they are assembled
- The conservation techniques and how to maintain the building for safety

4. Methods and Methodology:

The exploration manages an examination of Earthquake and its effect on the heritage sites in connection of world, Nepal, Kathmandu valley lastly in Bhaktapur. Analysis of traditional Newar technology and other technologies is needed to save the monuments from earthquake. The city listed in world heritage site in 1978 AD and is well known because of its uniqueness in art and architecture. The methodology adapted to study the traditional Newar temples, buildings and the technology to save the historic building from earthquake.

- Examination of customary Newar technology and innovation to spare the land-marks from earthquake. The city recorded in world heritage site in 1978 AD and is surely understood as a result of its lavishness in workmanship and design.
- The system adjusted to concentrate on the customary Newar sanctuaries, struct-tures and the innovation to spare the memorable working from seismic tremor. It will audit different writing concerning the customary Nepalese and Newar worki-ing as for building innovation and development innovation of sanctuary and royal residences.
- Primary information was gathered through photos, visual perception (building condition, story, utilizes and so on.), estimations (building stature, width, patio and road width and so forth), maps and drawings (upgrading existing maps, making vital AutoCAD drawings and so on). Meeting was taken to various faculty require din significant association (Bhaktapur district, nearby expert, Khwopa engineering college.
- Questionnaire review was done to the nearby occupants in the exploration zone. Questions for the study concentrate on physical and social weakness contemplates which address the distinctive issues like building types, age, uses, construction technology, material, vulnerable groups, perceptions of different risks, level of poverty etc. The development and material point of interest will be examined regarding their capacity development process, building material, properties.

5. Materials, Construction Technology & Decays:

5.1. General Perceptions: Traditional buildings in Bhaktapur are specialized by the homogeneity in detail elements, materials and craftsmanship. The high aesthetic architectural tradition-s reflected by the balanced of carved wooden door and window of the sober brick surface. The physical of the building shows the deficiencies of construction technology and structural systems. Constructional practice and methods reflected by the traditional life pattern through the inheritance of culture, religious and spiritual orders. It is matter to innovate the new technology or constructions system to save from the earthquake or any kind of natural disasters.

5.2. The Basic Building Detail (Traditional Building Detail): General proportion and building detail such as door, windows, walls, posts and beams are quite similar to each other both internally and externally. The building materials bricks, clay, timber and tiles are used in the building which will be easy to explain the way of construction technique in general. In the text all building terms are given in Newar as this is the language from which nearly all building terms are derived.

5.3. Brick Work: Foundation, walls the basic foundation (jags) of small temples, dwellings, monasteries are generally constructed of a few layers of natural stone, the wall thickness ground floor is made by brickwork which continues into the superstructure without any damp prove layer. The foundation of building is not much deeper than 60-80 cm and wider than 70 cm because of poor soil condition of Nepal valley. The pha (plinth) is the part of foundation, raised ground floor brickwork as a protection against damp penet-ration which hold the building above the road level. Stepped plinth is also a striking feature in Newar building. Nyatapol temple in Bhaktaur has five level of high plinth and Taleju temple in Kathmandu has twelve shallow plinths to raise the temple from the ground. The structures of the plinth are unknown. Taleju temple and Nyatapol temple stands on a huge masonry square filled with soil which is circumscribed by stepped plinth of brick work.

5.4. Newar House Construction: It is not possible to make a long span structure with a timber beam, a central support of Dhatu Anga (central wall) or a row of supporting Tha (timber post) is used to provide a support structure. The floor and roof of residential building are made by the wall structure. The floor Dhalin (joist) is rest on nuss (wall plate) and is held in positions in si chuku (wooden peg) through whole of the plates. The Dhatu Anga is supported by Dhalin which is responsible to minimize the span. Dhalin put side by side with the alternative contrast of span to the side and back walls. The spacing is equal between the Dhalin and the breadth of Dhalin. The depth of Dhalin is less than the width the Dhalin laid flat and occasionally the square shape is used for Dhalin.

5.5. Tiered Temple Construction Techniques: As a case study here only described the tired temple to understand

the basic philosophy and the building detail and construction techniques, materials to identify the solution for the safeguard of the temples. The plan of the temple shows two forms at sanctum level, rectangular and square form. Only few temples follow the octagonal forms and fewer have circular sanctums. The sanctum room is punctured by doors from four directions and the entrance is expressed by the torana placed over main doors or by keeping all doors closed. The artistic and symbolic timber doorways in each cardinal direction that are curved and embellished are pierced by the brick core in sanctum level. The three doors are blind doors only to show the symbolic design outline of doors. The Ghandvar (solid door) or bhadra (the buttress) is the requirement of ritual design. The sanctum room has cornice band going all around over the main entrance.

5.6. Timber Construction Technology: Timber is one of the basic construction materials of Nepali traditional architecture, especially for structure, decorative doors, windows and rafters. For structural purpose wood is used and soft pine wood is used for the decorative work. Pine was used before widely because of its durability, can stay many years, and cheaper. But timber always suffers from water penetration. Rain water leakage, insects attack or fungal can easily destroy the structure. Other problem comes when the moisture rises from the ground by capillary actions. It is visible that many joints are affected by the ground damp especially in inner wall because outer wall may have more air circulation and sunshine to dry the wooden structure.

6. Conservation Techniques:

Historic building is the witness of time culture for a long period, it is important to preserve the old building to keep the history for the future generation. Not only to conserve the old building but also keep the traditional techniques of construction technology. This part will explain the traditional techniques and modern techniques to under-stand the value of heritage.

6.1. Timber Conservation Technology: Repair or conservation work contains maximum amount of original fabrics and involves less work. But people think that repair means lots of work and more expensive but on contrary repair takes less time and cheaper than built a new building. For example, repairing a decayed post it is easy to replace a part or piece of timber no need to change the whole post. It remains the authenticity of the original fabrics and reduced the work load.

6.2. Masonry Wall Conservation Technology: Stitching: The crack on the wall which caused by the movement in the masonry can be stitched. Cutting out the crack bricks and inserting the new bricks is the technique of stitch. It is possible to repair the cracks if the cracks in masonry are very minimal movement. By using the strips of nonferrous mesh in the mortar beds between the bricks, use it back from the front face wall. So nobody can recognize the stitch. These are also helpful to spread out the load to the masonry on the other side of cracks. **Wall Bonding:** It is easy to repair the small part of three layers wall. The outer wall can be repaired if the middle and last part sounds good structurally and can carry the load during the repair work. It is recommended to use the yellow clay instead of black clay during the conservation time, black clay may produce the vegetation and also can weakened the strength of bonding.

6.3. Innovated Construction Technology: The new technology or innovation of modern technology is not an easy task and always have some problems, especially during the restoration process of historic building. Old systems cannot simply be discarded as redundant in favor of new ones. Every element contains the witness of different phase of historic evolution. Because of restoration the historical evidence should not be manipulated and in Nepal broad research and expository documentation has yet to be completed. The traditional old techniques are implemented with a little innovation and improved technology used for restoration.

7. Conservation for Future:

7.1. '55 Window Palace': The 55 window palace is the role model of developed traditional technology against earthquake or natural disaster. It proved the priority of three prolonged approach and still stands proudly after the 2015 earthquake. It has also proved that using the modern material is not the only solution for preserving the old heritage and it is also against the archeological standard. After the 1988 earthquake, the conservation of window palace was a great issue with lots of debates between the traditional technology, materials and industrial construction materials and technology. Lots of experts were working to restore the historical palace and making their own proposal and their new innovation of conservation. In 1993 first proposal was introduced by foreign conservation experts, they proposed the reinforced concrete slabs, one for longitudinal wall, one for vertical stiffening of east and west wall and diagonal steel rod of timber post lintel. Local professionals and archeological departments refused the proposal. In 1995 the engineers of the archeology department proposed a new proposal similar to the previous one. Only they proposed the timber trusses instead of concrete slabs and again it was rejected. In 1996 a renowned international expert after a day long discussion proposed a steel box in the ground tied to a concrete slabs, concrete slabs in second floor and steel or timber wooden frame work in the gallery area. And it was supported as a best available option by the UNESCO consultants and Nepalese experts was checked the entire earlier proposal, survey the condition of the palace and others historical buildings. Their proposal could not work by the states and could not follow the system of the art knowledge and earthquake resistance which they

implemented from the industrial technology. But it made an extraordinary assessment and help to understand the heritage value and conserved the palace with the respect of traditional method, and traditional structural system to contain in load bearing strength and earthquake resistance.

7.2. Working Procedure: To study the conservation techniques and its developments the architects maintained all the requirements of the aesthetic, architectural and structural nature through its original documents. The palace was taken to construct more than two decades (1702-1722 AD) and Bhupindra Malla positioned the squire shaped courtyard which was done by his father. The south-east corner was same like it was before. The following fact can be described by the facts:

- The foundation was below the floor with N-S axial lines of the building
- The outline of courtyard behavior
- The east side has three bayed viman windows on inside
- According to thyasafu record, Bhupendra malla's father did the foundation on eastern part before the new palace construction
- Following the building pattern the footing of foundation was done

There are difference at foundation level and asymmetric from left to right in west wing) disorganization of windows and doors could be opposite of the east origin-al wings. Thick wall is constructed at southeast corner and no similarities in the detailing p-art of doors and window lintels levels. During the next reconstruction period the asymmetric part of east part and other feature of the corner were changed. The tiki windows and the disorganized doors are older than 1702 construction period. The chota living room and western part of the palace are the newly constructed by Bhupendra Malla and the viman window at first floor are older one. The original staircase was at east and west part of the building and the overall wall is not so clear to understand because of lots of questions arises. There is no direct gateway for communication to courtyard and disorganized first floor joists are disagreed. Reintroducing the symmetric elevation by changing the position of doors and windows are visible in study. The totally new symmetric design of doors and windows set a new courtyard forming a new palace.

In 1934 earthquake the building went away and the chota floor of the south part tilted down. The earth shake from north - south and the top floor felt forth to the south. The side part and the lower part of the building were existed. The inside varanda and its bare roof also felt down. The tie system of the base of viman window and the floor over the bed room was safe. That is remarkable that failure happened only the part which has timber framed floor with a heavy weighted roof. The structural engineer already gained successes to give innovative jointing for floors and corner viman windows. The other innovation was the frame construction of the long multi bayed viman windows running from corner core to corner core. Roof joints should be the considered as failure. The critical area of joints can be considered as a week point during the earthquake. The joints were too strong before but for 220 years, the water penetrations on the joints of timber frame have weakened the structure and heavy earthquake causes the damage. The eleven opening arrangements and the spanned wall made the division of the building at ground floor level. The original set of cross wall was done by 2+2+3+2+2 in an opening in an eleven opening compositions.

The two basic considerations were taken by the architects and engineers when they were conserving the 55 windowed palaces:

- Weakness of structure against earthquake
- The tilted wall of the building and the need to paint in the king's bed room. During 1933 earthquake the building structure was strong to survive itself, but it was not well preserved and was neglected, and during 1934 earthquake it was damaged but only the chota floor tiled out. The new invented structure is now the backbone structure done by the expertise after long research.

The wall thickness changes from ground to top floor. At ground floor the wall thickness is 1m, second floor it reduces in 30 in and in top the thickness is 18 inch. Three steps flowed during the construction work:

- In middle part some posts, walls removed and missing cross wall reconstructed from ground to second floor on southern part of the building
- Then in the east and west part was reconstructed from second floor to top floor
- Third they conserved the around specially the top where 55 window are placed.

8. Maintenance:

Good enough renovation guarantees that current historical materials remain in exact condition and are not weaken by using rot, rust, decay or different moisture troubles. Without exception, historic homes must be well maintained and an evacuation plan advanced. Expectation is that an earthquake will occur every so often in future needs to prepare the owner to have emergency records and resources accessible.

8.1. Maintenance and Conservation Organization:

Before the conservation and restoration work was followed by the Hindu literature and books and depended on the socio-religious phenomena. The great epic Mahabharat pronounced a terrible curse upon those who tamper with

the endowment for the preservation of any temple. For example it was known that who will donate the land or money he will go to heaven for sixty years after death and who will refuse to do that he will go to hell for next sixty years after death.

Guthis: Guthis is a trust and maintained the monuments after observing the problems. The Guthi's owner liked to donate the land or cash for daily maintenance. During Lichavvi period there were many kinds of guthis, Archa guthis who were responsible to repair the sculpture. The daily maintenance was also carried during Mallas and Shahas. One of them still existing but not infested to take the restoration projects.

Chhen- Bhadel Office: During Rana period the public organization Chhen Bhadel was responsible for repairing to ancient monuments and structure.

8.2. Department of Archeology:

It is established in 2009 B.S. and equipped with legal power in 2013 B.S. It establishes an act called Ancient Monument Preservation Act, responsible to find out the preservation policies. It endeavored to make illegal traffic in antiquities and other objects of cultural value, unauthorized excavation and acquisition of monuments, sites and objects. DOA has right to punish who will go against the law. Due to the lack of instruments, and technology DOA cannot handle the huge restoration projects or repair of ancient monuments, it needs other expert agencies to handle the project named Upathya kanchal Tatkalin Sudhar Samiti commonly known as Valley reform committee.

But most of the Valleys reform committee only concentrates on the structural and civil engineering technology without considering the aesthetic, archeological, traditional pattern and restoration principles. Because of this negligence towards the monuments and historical importance disfigured. Guthi Sangsthan known as Guthi Jirnoddhar Tatha Nirman Samiti was established and worked jointly with DOA. GS donate fund and DOA provides knowledge and repaired hundred monuments together. Still now the department of archeology works for the restoration and conservation work. After 2015 earthquake they observed the projects and try to collect fund for the restoration. Still they have lack of technology and craftsman to conserve the massive loss of monuments after the 2015 earthquake.

8.3. Guthi Sansthan:

The Guthi established on 1964. According to Guthi Act, it worked for the construction, maintenance operation of temples, houses, roads, bathing places, schools, water supply, well, tanks, ponds, rest houses, hospitals, building or institute. They collected the fund from Guthi lands which has 88,000 Bighas (1 Hectare: 11.48) of land in southern Nepal and 400,000 Ropanies (1 Hectare= 19.65 Ropani) in the midlands and had uncountable antique jewelry.

8.4. Disaster management in Nepal:

Nepal is liable to numerous styles of natural disasters because of her rugged and fragile geophysical shape, very high peaks, excessive attitude of slopes, complex geology, variable climatic conditions, energetic tectonic processes, unplanned agreement, growing population, weak economic circumstance and coffee literacy charge a part from the above reasons, the lack of coordination among businesses associated with catastrophe management, no clear cut task description of these groups, useful resource constraint, the dearth of technical manpower, the dearth of public cognizance, very far flung, rural and hard geophysical state of affairs of the country, absence of cutting-edge generation are the opposite foremost obstacles to deal with the herb-al screw ups in Nepal.

In view of the above situation, formulation of an herbal catastrophe management regulation and amendment in the existing Act is wanted to make clear the task and obligations of the corporations associated with disaster control. Nicely trained technical manpower, superior generation and sufficient manner and sources also are hard to lessen the natural disasters. For an effective early warning device, it is needed to broaden a systematic detection system to monitor modifications inside the bodily environment. The machine of threat mapping, vulnerability evaluation and danger analysis needs to be developed as some of these sectors are nevertheless undeveloped in Nepal. For all this, there is the need of robust political dedication and powerful coverage system and their implementation. Regardless of the above problems and obstacles, Nepal is regularly selecting up the momentum in the direction of enhancing the disaster management state of affairs. Policy makers have proven hobby to check out the problems of catastrophe management from the factor of view of monetary development which is gaining energy within the U.S.A. Such interest of the coverage makers might prove to be conducive to apply existing clinical and technical knowledge to reduce vulnerability to herbal disasters and environmental dangers. Being a developing Nepal desires assistance and assist from international groups and friendly nations to strengthen her capabilities for natural disaster prevention and reduction, making early caution device as the important thing element. Now a day's different Government bodies of Nepal like : the Ministry of Home Affairs, the Ministry of Water Resources, the Ministry of Housing and Physical planning, the Ministry of Health, the Ministry of Finance, the Ministry of Defense, the Ministry of External Affairs, the Ministry of Public Works and Transport, the Ministry of Information and Communication, the Ministry of Forest and Environment, the Ministry of Agriculture, the Ministry of Education, the Ministry of Science and Technology, the Ministry of Women and Social Welfare, the Ministry of Supplies, the Secretariat of National Planning Commission, the Nepal Army, Nepal Police, Nepal Red Cross Society Nepal Scout, the Department of Mining and Geology.

9. Future Directions and Further Study:

By the evidence of references and archeological records maintenance and renovation works started from the ancient period for several times in Newar period to Rana and Shah Period. The increasing number of urban population, the traditional pattern of cities began to change and the soil condition has become uncomfortable for monuments and lack of maintenance causes the destruction of monuments. The traditional methods and construction technologies and lack of crafts man are not available and it seems more expensive. The economic condition of Nepal is not so rich & difficult to arrange the money for future preservation work from local and foreign agencies. New technology can be cheaper rather than traditional one, but it could be against the law of international preservation policies. My further research will be in between the traditional technology and the adapted new technology which will maintain the international law and can save the monuments from any kind of unpleasant natural disasters.

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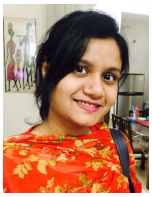
End Notes:

Bhaktapur Durbar square of Nepal that is comprised of temples, palaces is one of the vital parts of its old heritage. The earliest reports records of its temples and palaces can be found in 12th century by Lord Ananda Malla of Medieval period. Durbar square was proclaimed the world heritage site in Nepal and turned into a minority structural legacy that is of potential quality for the world cultural heritage. The earliest earthquakes which happened a few times extraordinarily in 1934 created extreme harm to the landmarks and its urban settlements including the 55 window palace, Krishna temple, 2359 settlements in Bhaktapur range completely annihilated. Again 2015 Gorkha earthquake caused harm to the monuments in Nepal valley. The exploration of this study was to discover the counter Semitic key innovation and post seismic tremor remaking time of Nepal including heritage worth, material and traditional way of use the techniques, protection against and mitigation of earthquake disasters and toward the end author ought to keep the nearby smiths as a the base and cutting edge innovation as supplement.

Author's Profile:



Homyra Adib Khan just has accomplished her Master Degree on Monumental Heritage from Anhalt University of Applied Science, Dessau, Rosslau, Germany with the highest grade in thesis and research work. At past, she earned Bachelor of Architecture Degree and showed her colossal potentiality on structural and architectural establishments. She has the academic international exposures due to the partaking and contribution of several training, workshops and conferences. She is currently one of the valued members under the Institute of Architects Bangladesh. Travelling makes Homayra as rich as she wanted to and she engages herself in some sort of creative and exclusive artworks which may accelerates standards. Her vicinity of interest is in-depth architectural research in near next.